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EXPECT MORE CORN AND CEREAL PRODUCTION IN THE UNITED KINGDOM

by

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The United Kingdom is a leading customer for U.S. farm products. Last year British buyers purchased nearly $85 million worth of U.S. feed grains of which about $80 million was corn. In 1972 the United Kingdom ranked as the sixth largest U.S. market for corn. Feed grains represented 18 percent of their $481 million spent for U.S. farm products.

Entry into the European Community (EC) in January, 1973, means the United Kingdom will move gradually to much higher prices for many farm products. Cereal grain prices in the EC are supported far above those in the U.S. (about twice as high) and most of the world. A variable levy protects EC farmers from price fluctuations and imports. Excess production is eligible for a subsidy to move products into world markets in competition with third countries. In the case of wheat, a denaturing process and payment makes wheat a feed grain in the EC.

There have been widely divergent views on the shifts in United Kingdom agriculture upon adjustment to EC policies. One school of though holds that very little change in the United Kingdom cereal output will occur and likely will remain in the 13 to 15 million long ton (2,240 pound) range. At the other extreme are those that feel a big increase in cereal output will occur in response to higher EC grain prices.

This article reflects on potential cereal output secured from a study trip to the United Kingdom in 1972 in which knowledgeable people in government, business, trade associations and universities were interviewed. The results and analyses reflect the authors judgment in arriving at a "concensus" view. The major focus will be on potential corn for grain production in the United Kingdom. To provide sufficient basis for understanding some of the potential effects of the United Kingdom joining the EC, a brief assessment of arable land use patterns and shifts in cereal acreage, yields and output will be made.

Corn Production Experiences

Corn production in the United Kingdom is very small though expanding rapidly. Corn silage was grown on 10,000 acres in 1972, mostly in the Southeastern part of Britain. Use has been spreading north and west. Corn for silage is substituting for rotation grass crops since yields of 4 to 6 tons per acre on a dry matter basis compare very favorably.

For grain harvest in 1970, only about 1,000 acres of corn were planted; in 1971 some 2,000 acres; and in 1972 about 4,000 acres were planted. Corn yields have approached 2 long tons (80 bushels) per acre though some producers have harvested 3 tons. Learning the production techniques and shifting corn to the best land on each farm have been major factors in improving yields.

Net returns, considering yields, costs and prices, are such that some producers in Southeast England find corn for grain the second most profitable cereal crop. On these farms corn follows wheat and is ahead of barley in profitability. Limited data from Wye College indicates gross margins in 1972 on an 88 bushel per acre corn crop prices at $1.875 per bushel (lower than EC

prices) are near $75 per acre when commercial drying and storage are used (Table 1). Net returns from $15 to $25 per acre would be expected if $50 to $60 fixed costs per acre are assumed. Producers with 120 bushels per acre would have more favorable net returns which acts as a further incentive to increase acreage of corn for grain.

Table 1. PARTIAL BUDGET ON CORN PRODUCTION IN UNITED KINGDOM, 1972

GROSS RECEIPTS PER ACRE:				
Yield:				
88 Bushels @ $1.875				$165.00
COSTS PER ACRE:				
Materials:	Off-Farm Storage		Farm Storage	
Seed	$11.25			
Fertilizer	19.25			
Spray	8.00			
		$38.50		
Propionic Acid			$5.00	
				$43.50
Services:				
Drilling	$ 2.50			
Combine	17.50			
Hauling	3.25			
Drying	27.50		$12.50	
		$50.75		$35.75
Total Variable Costs		$89.25		$79.25
GROSS MARGINS:				
Exclusive of Fixed Costs		$75.75		$85.75

Conversion Rate L = $2.50
SOURCE: Approximation of Mr. D. Sykes, Farm Management, Wye College, Wye, United Kingdom.

Expansion of corn production has been encouraged with prospective United Kingdom entry into the EC where corn prices receive price supports like barley and wheat. In addition, the government is interested in alleviating the United Kingdom balance of payments problem, and avoiding the the import duties on 3.0 to 3.5 million tons (120 to 140 million bushels) of corn imported, of which half to two-thirds usually comes from the U.S.

British corn producers have some barriers to overcome arising from their climatic conditions. The general lack of a sunny and warm growing season makes it difficult to mature a corn crop with present varieties. New varieties suited to the British climate can and are being developed by the seed companies. They must harvest corn at 40 percent moisture content; this is expensive and is a harvesting bottleneck. To afford the combine and farm dryer a minimum of 150 acres are required to have a viable corn producing unit. This is possible since United Kingdom farms are relatively large. Research grants are designed to improve cultural, harvesting and storage practices for corn for grain.

Corn Expected to Increase

It appears that acreage of corn for grain may increase in importance as a cereal crop in Southeastern England though a bad growing season like 1972 may slow down expansion. Producers have found corn to be not only a profitable crop but also a crop that improves labor distribution, is easy to handle, improves grass and weed control, has few diseases and is a useful break crop.

There is a potential for increased acreage of corn for both grain and silage. Climatically about 2,000,000 acres could grow corn for grain; more for silage. However, competition from other crops, agronomic practices, and difficulties enumerated earlier are deterrents. Many felt corn for grain acreage at the end of this decade may reach 200,000 acres. The range of estimates was from 100,000 to 500,000 acres. Increased corn for grain acreage must come largely at the expense of oat and barley acreage. Substitution for barley is associated with disease, rust, insect and weed problems making corn more profitable. Some shift from rotated grass to corn for grain may occur.

With rapid acreage expansion by inexperienced farmers average corn yields may remain near the 2 ton or 80 bushel per acre level. If this occurs on 200,000 acres the total output of corn may reach 400,000 tons by the end of this decade. The 400,000 tons is about 2 percent of total cereal output. Assuming this output and continued needs of 3.0 to 3.5 million tons of corn, the United Kingdom would grow 11 to 13 percent of their corn requirements.

Cereal Grain Acreage

The amount of arable land in the United Kingdom according to the 1971 census was 17,857,000 acres or 525,000 fewer than 1964 (Chart 1). Within the arable land area the acreage devoted to all cereal grains increased by 952,000 acres or 11.2 percent in the 1964-71 period. This is an average increase of 1.4 percent per year in grain acreage. The larger cereal grain acreage came from 1,105,000 acres shifted from temporary or rotation grassland and a reduction in all other crops of 372,000 acres. The major declines in other crops were in potatoes and fodder crops.

The land area devoted to grain crops in 1971 totaled 9,416,000 acres or 53 percent of all the arable land. This compares to 46 percent in 1964 when 8,464,000 acres were used to produce cereals. In this eight-year period the biggest acreage devoted to cereals was in 1967 when 9,443,000 acres were grown.

Shifts in land use have occurred within the cereals group. In the eight year period barley acreage increased 622,000 acres or 12 percent and wheat increased 504,000 acres or 23 percent. Of the total increase of 1,126,000 acres in wheat and barley only 169,000 acres came from a net reduction in oats and other cereal grain acreage. Worthy of note is that barley acreage has declined since 1966. Even so barley accounts for 62 percent of the total acreage devoted to cereal grains. Apparently some wheat-barley substitution is taking place encouraged by a widening difference in yields per acre favoring wheat (Chart 2).

Estimates of people naturally vary on the future expansion in cereal acreage. However, the judgments tended to center around a 5 percent increase after the five year and six step adjustment to higher EC prices that started in early 1973. The cereal acreage increase would come largely from less rotation grassland. However, this shift faces substantial competition from an expected

CHART 1: ARABLE LAND USE IN UNITED KINGDOM, 1964-71

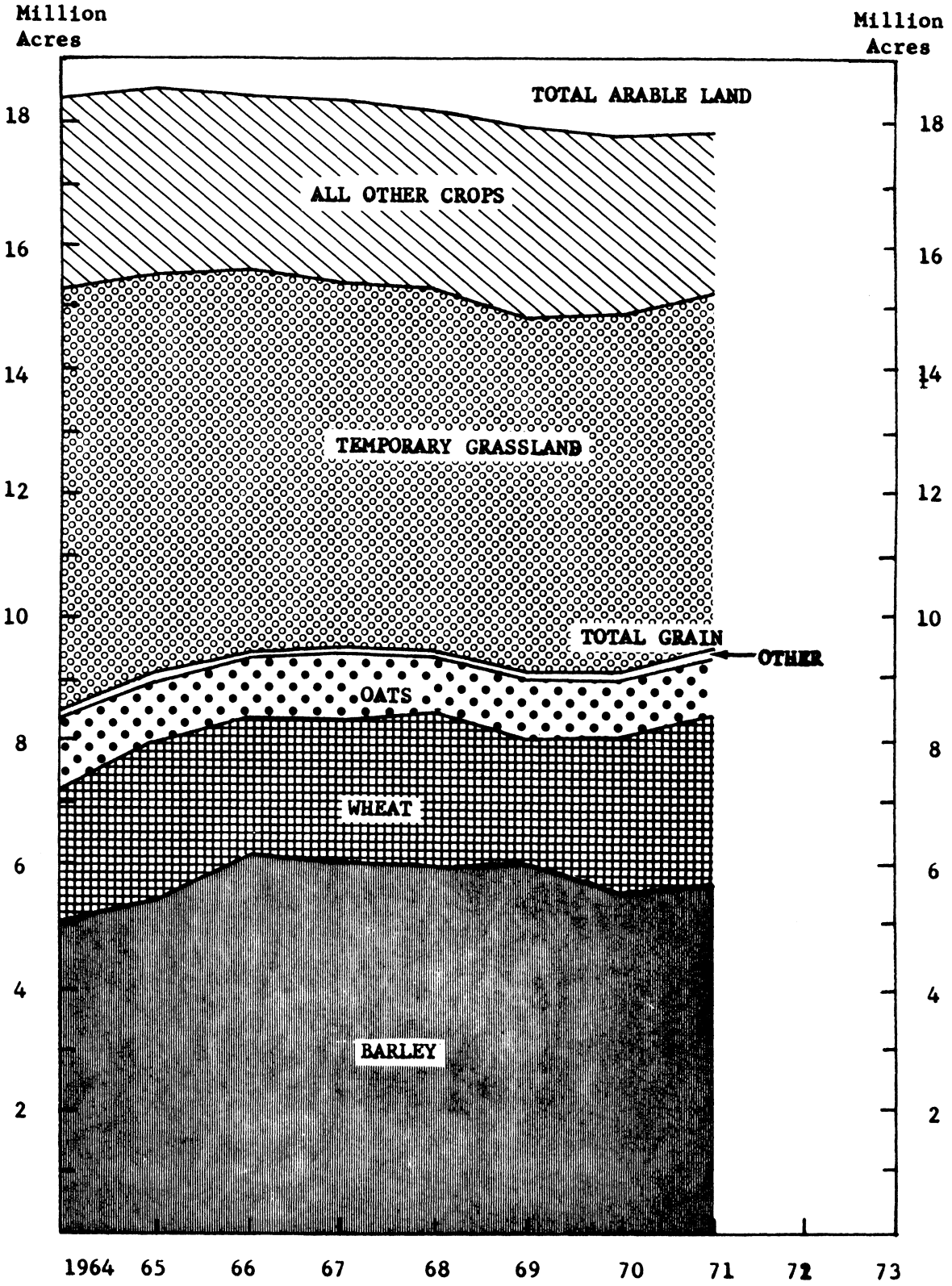
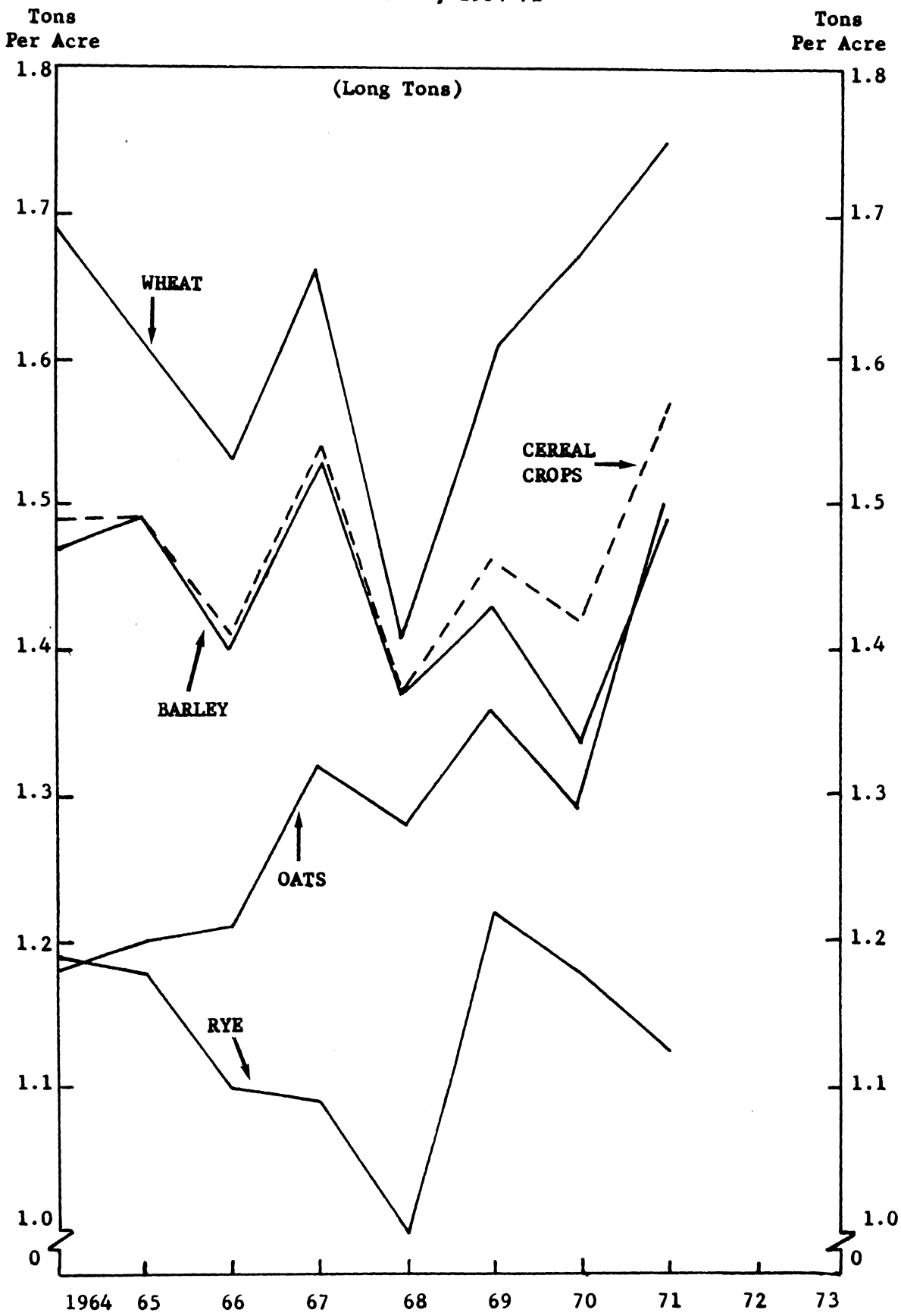


CHART 2: YIELDS PER ACRE OF CEREAL CROPS

UNITED KINGDOM, 1964-71



growth in an extensive beef industry. Implicit in the estimate were that EC 1971-72 basic support prices for wheat, barley and corn were $100.72, $92.02 and $79.31 per metric ton (2,204.6 pounds) respectively. If a 5 percent increase over 1971 acreage materializes British farmers would grow about 9,884,000 acres of cereal crops after adjustment.

Cereal Crop Yields

Yields for all cereal grains in the 1964-71 period averaged 1.49 long tons per acre (Chart 2). There is small evidence of a cereal grain trend increase in yields. Average yields for all grains ranged from a low in 1968 of 1.37 tons to a 1971 high of 1.57 tons per acre. Wheat yields averaged 1.62 tons (60.5 bushels per acre) in the eight year period. Wheat yields have exceeded the 1.49 ton cereal grain average in every year since 1964.

Barley yields seem to be declining. This was widely recognized and was attributed to disease, rust, insect and weed problems. This may be a temporary phenomena that might be overcome by technological developments, particularly new varieties. Oat yields are improving but the low gross margins relative to other cereals discourage acreage.

In the future, average yields from all acreage devoted to cereal crops may increase slowly encouraged by improved price levels relative to most other products. Some additional shift to wheat seems likely and would tend to improve average yields. Technological developments providing improved varieties and cultural practices may increase both wheat and barley yields. Production of corn for grain will tend to increase average cereal grain yields and output.

Future shifts of grassland to expand cereal grain acreage is at the margin. The low productivity of this land will be a deterrent to increasing average cereal grain yields per acre.

Output of Cereals to Increase

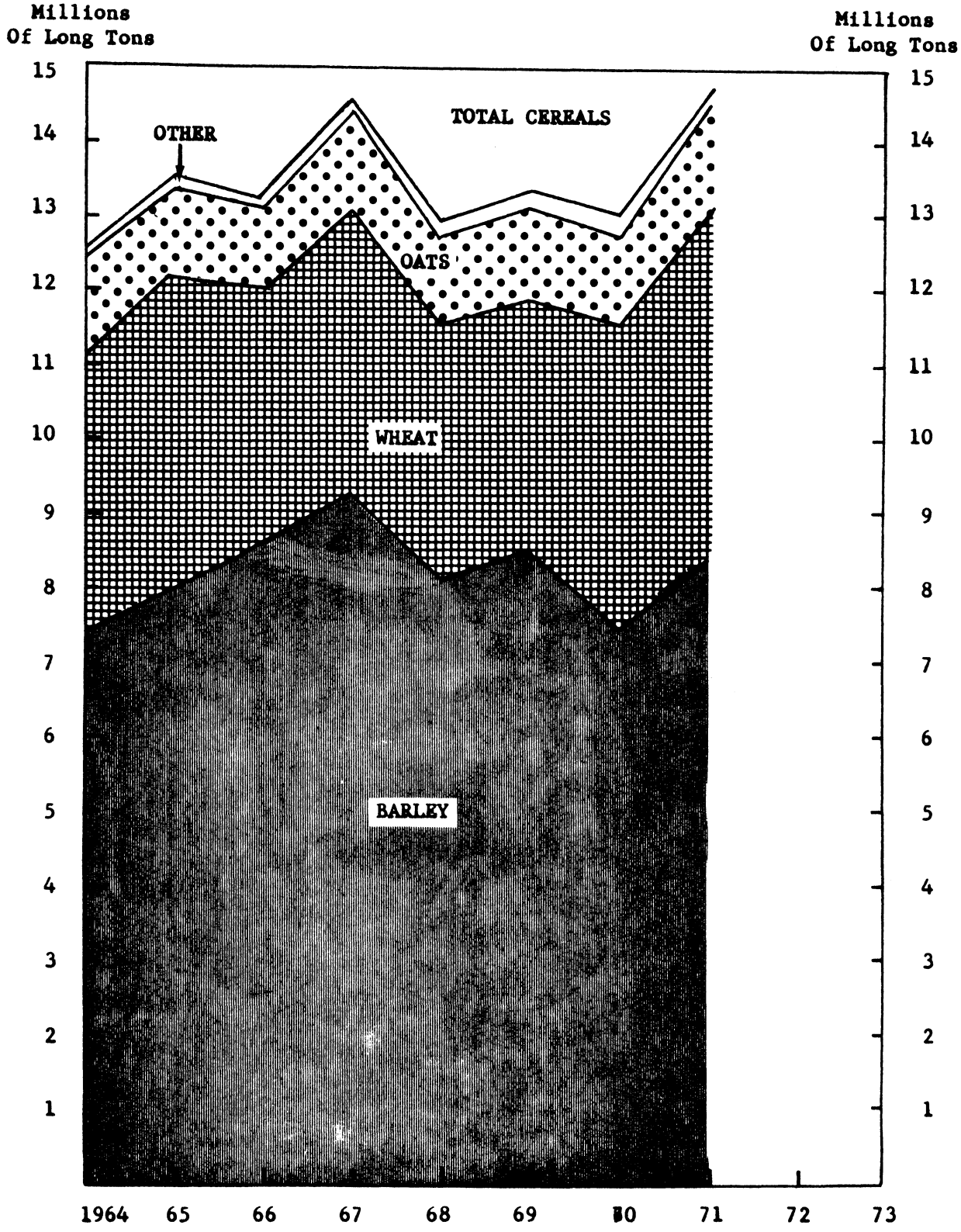
Total cereal grain output has averaged 13.5 million tons in the eight year period (Chart 3). This output came from average cereal grain yields of 1.49 tons per acre and an average of 9,054,750 acres. Total output has ranged from 12.6 to 14.8 million tons. The two high output years of 1967 and 1971 when output exceeded 14 million tons were due to unusually high yields per acre of 1.54 and 1.57 tons.

"Concensus" as to future grain output was that 16 to 17 million tons of cereals would be produced by the end of the decade. If attained, this would be an 18 to 26 percent increase over the 13.5 million ton average of 1964-71. This increase can come from increased acreage, improved yields or more likely, some combination of the two.

If cereal acreage expands 5 percent over the 1971 acreage to 9,884,000 acres, an average output per acre of 1.61 to 1.71 tons per acre would be required to produce the expected 16 to 17 million tons of cereal. This would require increases in average yield per acre amounting to 10 to 16 percent.

Wheat at 1.62 tons per acre is the only commonly grown cereal crop that has exceeded the needed average of 1.61 tons per acre (Chart 2). Corn has yielded

CHART 3: OUTPUT OF CEREALS IN UNITED KINGDOM, 1964-71



near 2 tons per acre, but would contribute very little to higher average yields since only 200,000 acres may be grown. Barley is the main feed grain. Its highest yields per acre was 1.53 tons in 1967 and has averaged only 1.44 tons. Substantial improvements in barley and wheat yields will be necessary to attain the expected output.

EC support prices have encouraged cereal crop production. This could provide the needed incentive to shift some land to wheat and corn and/or improve yields of barley and wheat sufficiently to attain the expected 16 to 17 million ton cereal output.

Some Impacts

Feed grain production in the United Kingdom will undoubtedly increase in the years ahead in response to improved prices and income. The feed grain output could be fully utilized by increased livestock numbers leaving the trade balance relatively unchanged. On the other hand, there could be a shift toward the production of grain fed livestock giving a boost to the demand for barley and other feedstuffs including corn.

More realistically the entry into the EC of the United Kingdom probably means less U.S. corn exports. This will come from 1) an increase in British wheat, barley and, to some extent, corn production, 2) increased use of wheat for feed encouraged by the denaturing payment, 3) larger purchases of French corn and feed grains, and 4) increased substitution of non-grain feedstuffs, like manioc, for feed grains in livestock rations. The latter may be tempered by the need for increased proportions of protein required and the higher protein costs. In any case there will be increased need for soybeans and soybean meal mostly from the United States, to meet the food and feed requirements of the United Kingdom.

Table A. ACREAGE OF ARABLE CROPS IN UNITED KINGDOM, 1964-71

Year	Arable Land	Wheat	Barley	Oats	Mixed Grain for Threshing	Rye	Total Grain	Other	Temporary Grassland	Permanent Grassland
					(Thousand Acres)					
1964	18,382	2,206	5,032	1,125	80	21	8,464	3,095	6,823	12,305
1965	18,523	2,535	5,395	1,014	73	18	9,035	2,970	6,518	12,138
1966	18,484	2,238	6,130	907	73	10	9,358	2,893	6,233	12,199
1967	18,325	2,305	6,027	1,012	88	11	9,443	2,975	5,934	12,388
1968	18,241	2,417	5,933	945	112	11	9,418	2,950	5,873	12,195
1969	17,943	2,059	5,962	945	156	9	9,131	3,074	5,738	12,348
1970	17,788	2,495	5,542	929	196	11	9,173	2,915	5,700	12,217
1971	17,857	2,710	5,654	896	140	16	9,416	2,723	5,718	12,172
% Change 1971/1964	-2.9	+22.8	+12.4	-20.4	+75.0	-24.0	+11.2	-15.3	-16.2	-1.1

Source: U.K. Annual Census

Table B. GRAIN OUTPUT IN UNITED KINGDOM, 1964-71

Year	Wheat	Barley	Oats	Mixed Grain	Rye	Total
			(Thousands of Long Tons)			
1964	3,733	7,404	1,325	101	25	12,588
1965	4,105	8,062	1,213	91	21	13,492
1966	3,420	8,586	1,102	93	11	13,212
1967	3,836	9,242	1,340	117	12	14,547
1968	3,414	8,140	1,205	151	11	12,921
1969	3,311	8,527	1,287	216	11	13,341
1970	4,169	7,410	1,198	253	13	13,043
1971	4,748	8,441	1,346	209	18	14,762
Average	3,842	8,226	1,256	154	15	13,486

Note: Long ton = 2,240 pounds

SOURCE: U.K. Annual Census

Table C. YIELDS OF CEREAL GRAINS IN UNITED KINGDOM, 1964-71

Year	Wheat	Barley	Oats	Rye	Cereal Crops
			(Long Tons Per Acre)		
1964	1.69	1.47	1.18	1.19	1.49
1965	1.62	1.49	1.20	1.17	1.49
1966	1.53	1.40	1.21	1.10	1.41
1967	1.66	1.53	1.32	1.09	1.54
1968	1.41	1.37	1.28	1.00	1.37
1969	1.61	1.43	1.36	1.22	1.46
1970	1.67	1.34	1.29	1.18	1.42
1971	1.75	1.49	1.50	1.13	1.57
Average	1.62	1.44	1.29	1.14	1.49

Source: Calculated from Tables A and B.